

**CLAIMS:**

- 1) A locomotive remote control system including:
  - a) a plurality of remote control units, each remote control unit being adapted for  
5 receiving commands to be implemented by a locomotive;
  - b) a plurality of locomotive controllers suitable for mounting on-board respective locomotives, the locomotive controllers in the plurality of locomotive controllers being adapted for causing their respective locomotives to implement commands;
  - c) said plurality of remote control units and said plurality of locomotive controllers  
10 being capable of communicating with one another over a common communication link, the common communication link including a plurality of TDMA frames, each TDMA frame including a set of time intervals, at least some time intervals in the set of time intervals being assigned to respective remote control units in the plurality of remote control units, the time intervals in the set of time intervals having a time  
15 interval length, the time interval length being variable.
- 2) A locomotive remote control system as defined in claim 1, wherein said time interval length is derived at least in part on the basis of the number of remote control units in said plurality of remote control units.  
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- 3) A locomotive remote control system as defined in claim 1, wherein said time interval length is derived at least in part on the basis of the number of locomotive controllers in said plurality of locomotive controllers.
- 25 4) A locomotive remote control system as defined in claim 1, wherein said time interval length is derived at least in part on the basis of the number of locomotive controllers and the number of remote control units in said remote control system.
- 30 5) A locomotive remote control system as defined in claim 1, wherein at least one locomotive controller in the plurality of locomotive controllers is operative for determining said time interval length.

- 6) A locomotive remote control system as defined in claim 1, wherein said system further includes a network entity in communication with said plurality of remote control units, said network entity being operative for determining said time interval length.
- 5 7) A locomotive remote control system as defined in claim 1, wherein said system further includes a network entity in communication with said plurality of locomotive controllers, said network entity being operative for determining said time interval length.
- 8) A locomotive remote control system as defined in claim 1, wherein at least some time  
10 intervals in the set of time intervals being assigned to respective locomotive controllers in said plurality of locomotive controllers.
- 9) A remote control unit suitable for use in a locomotive remote control system, the locomotive remote control system including a plurality of remote control units and a  
15 plurality of locomotive controllers communicating with one another over a common communication link, said remote control unit comprising:
  - a) a user interface suitable for enabling a human operator to enter commands to be implemented by a locomotive;
  - b) a control entity in communication with said user interface, said control entity being  
20 responsive to commands received at said user interface operative for generating command signals for transmission to a locomotive;
  - c) a communication interface in communication with said control entity, said communication interface being adapted for transmitting said command signals to a locomotive over a communication link during at least one time interval, the  
25 communication link including a plurality of TDMA frames, each TDMA frame including a set of time intervals, the time intervals in the set of time intervals having a time interval length, the time interval length being variable, at least one time interval in said set of time intervals being assigned to said remote control unit.
- 30 10) A remote control unit as defined in claim 9, wherein said time interval length is derived at least in part on the basis of the number of remote control units in the plurality of remote control units.

- 11) A remote control unit as defined in claim 9, wherein said time interval length is derived at least in part on the basis of the number of locomotive controllers in the plurality of locomotive controllers.
- 5 12) A remote control unit as defined in claim 9, wherein said time interval length is derived at least in part on the basis of the number of locomotive controllers and the number of remote control units in the remote control system.
- 13) A remote control unit as defined in claim 9, wherein said remote control unit is operative  
10 for determining said time interval length.
- 14) A remote control unit as defined in claim 9, wherein said remote control unit is operative for communicating with a network entity, said network entity being operative for determining said time interval length.
- 15 15) A network entity suitable for use in a locomotive remote control system, said network entity being operative for managing the assignment of time intervals in a TDMA frame for a number of communication entities in the locomotive remote control system, said network entity comprising:
- 20 a) an input for receiving from a communication entity a signal conveying a change in the number of communication entities in the locomotive remote control system;
- b) a processing unit in communication with said input, said processing unit being responsive to the signal conveying a change in the number of communication entities in the locomotive remote control system for deriving a time interval length associated  
25 to the time intervals in a TDMA frame;
- c) an output for releasing a control signal adapted for causing at least one time interval in the TDMA frame to be assigned to a communication entity in the locomotive remote control system.
- 30 16) A network entity as defined in claim 15, wherein said processing unit is responsive to the signal conveying a change in the number of communication entity for deriving a number of communication entities in the locomotive remote control system.

17) A network entity as defined in claim 16, wherein said processing unit is further operative for deriving a number of time intervals in the TDMA frame.

19) A network entity as defined in claim 15, wherein said number of communication entities includes a number of remote control units for transmitting commands to be implemented by a locomotive.

20) A network entity as defined in claim 19, wherein said number of communication entities includes a number of locomotive controllers for receiving commands from said remote control units.

21) A network entity as defined in claim 15, wherein said signal indicative of a change in the number of communication entities in the locomotive remote control system is indicative of an increase in the number of communication entities in the locomotive remote control system.

22) A network entity as defined in claim 15, wherein said signal indicative of a change in the number of communication entities in the locomotive remote control system is indicative of a decrease in the number of communication entities in the locomotive remote control system.

23) A remote control system for a locomotive, including:

a) a remote control unit at which an operator can enter commands to be implemented by a locomotive;

b) a locomotive controller for mounting on-board a locomotive for interfacing with the locomotive and cause the locomotive to implement commands;

c) said remote control unit and said locomotive controller capable of communicating with one another over a communication link, said communication link including a plurality of TDMA frames, each TDMA frame including a set of time intervals, the time intervals in the set of time intervals having a time interval length, the time interval length being variable.

24) A remote control unit suitable for use in a locomotive remote control system, the locomotive remote control system including a plurality of remote control units and a plurality of locomotive controllers communicating with one another over a common communication link, said remote control unit comprising:

- 5 a) means for enabling a human operator to enter commands to be implemented by a locomotive;
- b) means for generating command signals for transmission to a locomotive in response to commands received at said means for enabling a human operator to enter commands;
- 10 c) means for transmitting said command signals to a locomotive over a communication link during at least one time interval, the communication link including a plurality of TDMA frames, each TDMA frame including a set of time intervals, the time intervals in the set of time intervals having a time interval length, the time interval length being variable and at least one time interval in said set of time intervals being assigned to
- 15 said remote control unit.

25) A method of assigning time intervals in a TDMA frame to communication entities in a locomotive remote control system, said method comprising:

- 20 a) receiving a signal conveying a change in the number of communication entities in the locomotive remote control system;
- b) deriving a time interval length associated to the time intervals in the TDMA frame on the basis of said signal conveying a change in the number of communication entities in the locomotive remote control system;
- 25 c) assigning at least one time interval in the TDMA frame to each communication entity in the locomotive remote control system.

26) A locomotive remote control system including:

- a) a plurality of remote control units, each remote control unit being adapted for receiving commands to be implemented by a locomotive;
- 30 b) a plurality of locomotive controllers suitable for mounting on-board respective locomotives, the locomotive controllers in the plurality of locomotive controllers being adapted for causing their respective locomotives to implement commands;

- c) said plurality of remote control units and said plurality of locomotive controllers being capable of communicating with one another over a common communication link, the common communication link including a plurality of TDMA frames, each TDMA frame including a set of time intervals, at least some time intervals in the set of time intervals being assigned to respective remote control units in the plurality of remote control units, each TDMA frame having a length, the length being variable.

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